Revised 12/17B/10

Molecular Foundry
Working Alone and Two-Person Policy

General Policy Statement

The Molecular Foundry is committed to providing a safe working experience for all staff, students and users. Due to the presence of significant potential hazards in many Foundry laboratories, some operations are not permitted when working alone in laboratories outside of normal business hours or under unusual circumstances when the area is not occupied as usual.

This policy details the process for providing safeguards and authorization under which non-hazardous and low hazard work can be performed while alone, outside of normal work hours or under unusual circumstances when the area is not occupied as usual. Working alone can only be authorized for non-hazardous and low hazard work where there is no foreseeable risk of injury or exposure to an individual that may render him/her unable to take appropriate emergency actions.

High hazard work can never be performed while alone. This policy details a process for providing oversight and control under which high hazard work can be performed under a two-person rule.

- Normal operating hours for the Molecular Foundry are 8 am to 6 pm Monday to Friday except on designated holidays.
- This policy does not pertain to work in offices and meeting rooms.
- This policy does apply to vendors working in the Facility
- Undergraduates are not allowed to perform work alone beyond the non-hazardous level outside of normal operating hours
- The use of personal music players, Bluetooth phones or any other personal device that may interfere with hearing is not permitted in Foundry laboratories

Definitions

Working Alone - Means that there is nobody within sight or earshot.

Two Person Rule - In order to not be considered as "working alone" the person working must satisfy the following conditions:

1. There is a second person within eyesight or earshot;
2. The second person is appropriately trained to respond to likely emergencies;
3. The second person agrees to serve in this capacity, and;
4. If the second person has to leave the area, the activity is considered to be working alone, and must terminate. Bathroom breaks of no more than 2-3 minutes would not require work to stop.

Work Hazard Levels

Work in the Molecular Foundry falls into three hazard categories:

Non-Hazardous Work Activities: those activities where the risks are not significantly increased beyond those created by everyday living situations. Examples of non-hazardous activities include desk work, observing through a microscope, computer operations and handling non-hazardous buffers in labs where low and high hazard work is not concurrently performed. Working alone for these tasks can be approved by a blanket review, as described below.

Low Hazard Work Activities: those activities which, in an off-normal event, could present the potential for significant, although not life-threatening or incapacitating injury or illness. Low hazard activities include work with chemicals inside of inert gloveboxes, working with Class 3B or 4 lasers, electrical testing of circuits < 50 volts, changing non-toxic/inert gas cylinders. Work alone for these tasks must be approved on a case-by-case basis, as described below.

High Hazard Work Activities: those activities which, in an off-normal event, could present the potential for immediate danger to life or incapacitating injury or illness. Highly hazardous activities include work on exposed hazardous voltages of 50 volts or greater, work with exposure to corrosive, flammable or toxic chemicals outside of a glovebox where, if released, the concentration and quantity present an immediate danger to life or incapacitating injury or illness. Also work involving moving parts in open tools and working while safety interlocks/devices are defeated. Working alone for highly hazardous tasks can never be authorized.

Tasks Banned Off-Hours

Certain highly hazardous tasks are never permitted outside of 8 am to 5 pm weekdays, even if not working alone. This includes:

- Changing of toxic/pyrophoric/corrosive gas cylinders
- Energized electrical work > 50 volts
- LOTO of any circuit ≥120 VAC

Authorization of Work

Working alone in the Molecular Foundry can only be authorized under limited circumstances by one of the processes described below:

Non-Hazardous Activities: Each Facility Director, in consultation with the MSD EH&S Manager, will develop a list of work and labs that fall into this category. The MSD EH&S Manager will review these lists to determine if they meet the details and intent of this policy. When approved by the EH&S Manager, staff, students and users may be authorized by their work lead to perform this work without further EH&S review. The

EH&S Manager will keep a master record of these determinations.

"Working alone" will only be permitted once the person has demonstrated his/her competence in the lab under supervision. She/he must have previously successfully and safely performed the specific tasks under direct observation of a Foundry staff person. The work lead will consult with technicians and other staff and users as appropriate to determine if an individual is truly qualified to work alone.

Low Hazard Activities: Work leads must meet with the individual proposing to perform low hazard work while alone and review the work plan using the MSD Experiment Risk Assessment Form. The work lead will evaluate both the hazards posed by the work, the hazards posed by collocated work and the skill level and reliability of the requester. If the work lead determines that the proposed work can be performed alone in accordance with this policy, this decision must be reviewed and approved by the MSD EH&S Manager.

"Working alone" will only be permitted once the person has demonstrated his/her competence in the lab under supervision. She/he must have previously successfully and safely performed the specific tasks under direct observation of a Foundry staff person. The work lead will consult with technicians and other staff and users as appropriate to determine if an individual is truly qualified to work alone.

The Work Lead will document the final authorization of work by adding this individual to the "Foundry Working Alone" workgroup in the JHA database. The approval is valid as long as the work does not change, for users up to the duration of an approved user project.

Highly Hazard Activities: An individual can only perform high hazard work tasks when the employee is constantly within sight or sound of another qualified individual. This is known as the "Two Person Rule". This second qualified individual must be trained to react appropriately to the hazard(s) involved. This training must include how to respond to foreseeable emergencies.

Working Alone Master Prohibition List

Work having the following attributes may never be performed alone.

Work where a foreseeable injury or exposure may render an individual unable to take appropriate emergency actions. Examples include:

- Corrosive chemical splash to the face that blinds an individual
- Chemical exposure or trauma that impairs consciousness
- Individual set on fire
- Severe electrical shock or arc flash injury
- Unmonitored oxygen deficiency
- Work with open flames, power cutting tools, or welding equipment.

Some specific examples are:

- Handling highly corrosive, toxic, pyrophoric or air/water reactive materials outside of a glovebox
- Work with chemicals with very high dermal toxicity (e.g. TMAH, dimethyl mercury, phenol)
- Any form of LOTO or energized electrical work >50 volts
- Changing toxic/corrosive/pyrophoric gas cylinders
- Moving heavy equipment
- Significant work on ladders
- Spill cleanup
- Work with radioactive materials
- Changing or handling pyrophoric reservoirs (e.g. MOCVD bubblers)
- Opening outer packaging of hazardous chemicals still as shipped
- Synthesis activities including reaction setup, workup, and monitoring outside of a glovebox if corrosive, pyrophoric, air/water reactive or toxic materials are involved
- Filling and handling of large cryogen dewars
- Reactions with unusually large quantities of flammable liquids (>500 ml)
- Work with chemicals that could generate toxic or flammable gases upon mixing such as acids and sodium cyanide, iron sulfide and calcium carbide.
- Work with cryogenic systems including liquid helium flow systems, large dewars, cryo-tem plunge freezers
- Transportation and use of bottles 4L or larger unless the bottle is safety coated.
- New or not frequently performed experiments.